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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,758	09/04/2001	Vadim Y. Banine	P 282980 P-0202.011-US	8495
909	7590	01/26/2004	EXAMINER	
PILLSBURY WINTHROP, LLP			NGUYEN, LAM S	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	

2853

DATE MAILED: 01/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/943,758

Applicant(s)

BANINE ET AL.

Examiner

LAM S NGUYEN

Art Unit

2853

aw

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14, 16 and 17 is/are rejected.
- 7) ☒ Claim(s) 13 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in EUROPEAN PATENT OFFICE on 09/04/2000. It is noted, however, that applicant has not filed a certified copy of the EPO 00307608.0 application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-12, 14, 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui et al. (US 5991360) in view of McGeoch (US 6421421) and Kanouff et al. (US 6198792).

Matsui et al. disclose a lithographic projection apparatus (FIG. 1) comprising:

a radiation system to supply a projection beam of radiation (FIG. 1, element 100);

a support structure adapted to support patterning structure (FIG. 1, element 16) which can be used to pattern the projection beam according to a desired pattern;

a substrate table to hold a substrate (FIG. 1, element 18);

a projection system to project the patterned beam onto a target portion of the substrate (FIG. 1, element 200);

Matsui et al. do not disclose the comprising of a gas supply, configured and

Art Unit: 2853

arranged to supply a gaseous to a space containing a mirror, at least one sensor selected from the group comprising a reflectivity sensor to monitor a reflectivity of said mirror and a pressure sensor to monitor a background pressure in said space and a gas supply control, and a gas supply control responsive to a signal from said at least one sensor to control the gas supply, and wherein the radiation system comprising one of a laser-produced plasma source and a discharge source adapted to supply a beam of extreme ultraviolet (EUV) radiation as said projection beam having a wavelength of less than about 50nm, or in the range of from 8 to 20nm, or in the range is from 9 to 16 nm (**Referring to claims 3-6**), and wherein the mirror is a collector mirror (**Referring to claim 9**).

McGeoch et al. disclose a radiation source comprising a gas supply (Fig. 5, element 520) configured and arranged to supply a gaseous to a radiation system containing a mirror (FIG. 5, element 550 and column 10, line 11-15: a multilayer mirror in the detector 550) (**Referring to claim 2**), at least one sensor selected from the group comprising a reflectivity sensor to monitor a reflectivity of said mirror and a pressure sensor to monitor a background pressure in said space (FIG. 5, element 550 and column 10, line 11-15: the multilayer mirror reflects a narrow bandwidth of the radiation), and a gas supply control (FIG. 5, element 552) responsive to a signal from said at least one sensor to control the gas supply, wherein the radiation system comprising one of a laser-produced plasma source and a discharge source adapted to supply a beam of extreme ultraviolet (EUV) radiation (as said projection beam having a wavelength of less than about 50nm, or in the range of from 8 to 20nm, or in the range is from 9 to 16 nm (Abstract) (**Referring to claims 3-6**), and wherein the mirror is a collector mirror (column 1, line 45-50) (**Referring to claim 9**).

Therefore, it would have been obvious for one having ordinary skill in the art at the time was made to include a gas supply, a mirror, at least one sensor, and a gas supply control responsive to a signal from said at least one sensor to control the gas supply as disclosed by McGeoch into the radiation source disclosed by Matsui et al. The motivation of doing so is to be able to control the rate of flow of the gas into the discharge in response to a measured spectrum of the radiated beam as taught by McGeoch (column 3, line 60-65).

In addition, Matsui et al. and McGeoch do not disclose that the gas is hydrocarbon, ethanol, or alcohol (**Referring to claims 7-8, 11-12, 16**).

Kanouff et al. disclose a lithography comprising a gas that is hydrocarbon, ethanol, or alcohol supplied to a discharge chamber (column 7, line 4-22).

Therefore, it would have been obvious for one having ordinary skill in the art at the time was made to use hydrocarbon, ethanol, or alcohol as a gas supplied to the radiation source as disclosed by Kanouff et al. into the radiation source disclosed by Matsui et al. The motivation of doing so is to be able to remove contaminants that develop from the wafer upon exposure to the EUV radiation as taught by Kanouff et al. (column 4, line 63-65).

Allowable Subject Matter

2. Claims 13, 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Referring to claim 15: The most pertinent arts Matsui et al. (US 5991360), McGeoch (US 6421421), and Kanouff et al. fail to disclose wherein the alcohol forms a cap layer on said mirror and wherein the gaseous alcohol is supplied to said space at a pressure sufficient to

Art Unit: 2853

achieve a thickness of said cap layer which does not increase substantially over time. Therefore, the claimed invention is not disclosed by the cited prior arts.

Referring to claim 13: The most pertinent arts Matsui et al. (US 5991360), McGeoch (US 6421421), and Kanouff et al. (US 6198792) fail to disclose the comprising of adapting the amount of gaseous hydrocarbon supplied to the space such that at least part of at least a top layer of said mirror undergoes sputtering. Therefore, the claimed invention is not disclosed by the cited prior arts.

Response to Arguments

Applicant's arguments with respect to claims 1 and 19 have been considered but are moot in view of the new ground(s) of rejection.

Regarding to the argument on page 5: The applicants argued that McGeoch does not disclose a reflectivity sensor. As discussed above, however, McGeoch discloses the detector 550 having the multilayer mirror and a separate silicon diode that monitors the reflectivity of the multilayer mirror (column 10, line 15). Therefore, the disclosure of McGeoch reads on the claim language of the claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (703)305-3342. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (703)308-4896. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Application/Control Number: 09/943,758

Page 6

Art Unit: 2853

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LN

January 23, 2004



HAI PHAM
PRIMARY EXAMINER